

CLAIM AMENDMENTS

1 - 77. (canceled)

1 78. (currently amended) A device for treating neuronal
2 brain pathologies involving the neurons of a large neuron
3 population firing in a synchronized manner, the device comprising:

4 a plurality of electrodes adapted for stimulating and
5 implanted in respective neuron subpopulations of the large neuron
6 population; and

7 means connected to the electrodes for generating and
8 feeding therethrough to the respective neuron subpopulations
9 stimulation signals each comprised of a burst of pulses having a
10 respective predetermined frequency capable of resetting the firing
11 of the neurons of the respective subpopulation and with the burst
12 fed to each subpopulation time shifted of the bursts fed to the
13 other subpopulations such that each subpopulation is reset at a
14 different point in time and fires out of phase with the other
15 subpopulations.

1 79. (previously presented) The device defined in claim
2 78 wherein each burst includes 1 to 20 pulses.

1 80. (previously presented) The device defined in claim
2 78 wherein the bursts are periodically administered by the
3 respective electrodes.

1 81. (previously presented) The device defined in claim
2 78 wherein the bursts all have the same time duration.

1 82. (previously presented) The device defined in claim
2 78 wherein the bursts are identical.

1 83. (previously presented) The device defined in claim
2 78 wherein there are at least three such electrodes and the time
3 offsets between the bursts of the electrodes are identical.

1 84. (currently amended) A method of treating neuronal
2 brain pathologies in which a large population of brain neurons fire
3 in a synchronized manner, the method comprising the steps of:

4 implanting electrodes in respective subpopulations of a
5 large neuron population to be desynchronized; and

6 stimulating each of ~~a plurality of~~ the subpopulations of
7 the large population via the respective electrode with a respective
8 stimulation signal each comprised of a burst of pulses having a
9 respective predetermined frequency capable of resetting the firing
10 of the neurons of the respective subpopulation with the burst fed
11 to each subpopulation time shifted to the bursts fed to the other

12 subpopulations such that the burst reset the neurons of each
13 subpopulation at a different point in time to fire out of phase
14 with the neurons of the other subpopulations.

1 85. (previously presented) The method defined in claim
2 78 wherein each burst includes 1 to 20 pulses.

1 86. (previously presented) The method defined in claim
2 78 wherein the bursts are periodically administered by the
3 respective electrodes.

1 87. (previously presented) The method defined in claim
2 78 wherein the bursts all have the same time duration.

1 88. (previously presented) The method defined in claim
2 78 wherein the bursts are identical.

1 88. (previously presented) The method defined in claim
2 78 wherein there are at least three such electrodes and the time
3 offsets between the bursts of the electrodes are identical.

1 89. (new) The method defined in claim 78 wherein the
2 electrodes are arrayed symmetrically.

1 90. (new) The method defined in claim 84 wherein the
2 electrodes are implanted symmetrically

1 91. (new) A device for treating neuronal brain
2 pathologies involving the neurons of a large neuron population
3 firing in a synchronized manner, the device comprising:

4 a plurality of electrodes adapted for stimulating
5 respective neuron subpopulations of the large neuron population;
6 and

7 means connected to the electrodes for generating and
8 feeding therethrough to the respective neuron subpopulations
9 stimulation signals each comprised of a burst of pulses having a
10 respective predetermined frequency capable of resetting the firing
11 of the neurons of the respective subpopulation and with the burst
12 fed to each subpopulation time shifted of the bursts fed to the
13 other subpopulations such that each subpopulation is reset at a
14 different point in time and fires out of phase with the other
15 subpopulations and for simultaneously outputting from two of the
16 electrodes identical bursts of pulses but with opposite polarities.

1 92. (new) A method of treating neuronal brain
2 pathologies in which a large population of brain neurons fire in a
3 synchronized manner, the method comprising the steps of:

4 stimulating each of a plurality of subpopulations of the
5 large population with a respective stimulation signal each

6 comprised of a burst of pulses having a respective predetermined
7 frequency capable of resetting the firing of the neurons of the
8 respective subpopulation with the burst fed to each subpopulation
9 time shifted to the bursts fed to the other subpopulations such
10 that the burst reset the neurons of each subpopulation at a
11 different point in time to fire out of phase with the neurons of
12 the other subpopulations; and

13 simultaneously outputting from two of the electrodes
14 identical bursts of pulses but with opposite polarities.

1 93. (new) A device for treating neuronal brain
2 pathologies involving the neurons of a large neuron population
3 firing in a synchronized manner, the device comprising:

4 a plurality of electrodes adapted for stimulating
5 respective neuron subpopulations of the large neuron population;
6 and

7 means connected to the electrodes for generating and
8 feeding through a subset thereof to the respective neuron
9 subpopulations stimulation signals each comprised of a burst of
10 pulses having a respective predetermined frequency capable of
11 resetting the firing of the neurons of the respective subpopulation
12 and with the burst fed to each subpopulation time shifted of the
13 bursts fed to the other subpopulations such that each subpopulation
14 is reset at a different point in time and fires out of phase with

15 the other subpopulations and for varying the subset used for
16 stimulation by using a stochastic or deterministic algorithm.

1 94. (new) A method of treating neuronal brain
2 pathologies in which a large population of brain neurons fire in a
3 synchronized manner, the method comprising the step of:
4 selecting a subset from a plurality of electrodes
5 implanted in respective subpopulations of a large population of
6 neurons;
7 stimulating each of the subpopulations of the large
8 population of electrodes from the subset with a respective
9 stimulation signal each comprised of a burst of pulses having a
10 respective predetermined frequency capable of resetting the firing
11 of the neurons of the respective subpopulation with the burst fed
12 to each subpopulation time shifted to the bursts fed to the other
13 subpopulations such that the burst reset the neurons of each
14 subpopulation at a different point in time to fire out of phase
15 with the neurons of the other subpopulations; and
16 varying the subset used for stimulation by using a
17 stochastic or deterministic algorithm.